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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/686,684	10/16/2003	Scott P. Crafton	C152 1092.1	7662

7590 09/21/2005

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EXAMINER	
LIN, ING HOUR	

ART UNIT	PAPER NUMBER
1725	

DATE MAILED: 09/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/686,684	CRAFTON ET AL.	
	Examiner	Art Unit	
	Ing-Hour Lin	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 June 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *67-102* is/are pending in the application.

4a) Of the above claim(s) *89-102* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *67-88* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 67, 84 and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Usui et al in view of Easwaran.

Usui et al (col. 3, lines 10+) teach the claimed method and system for processing a metal casting containing a core in a mold having heat treatment of the casting in the mold transported in a heat treatment station including at least one heat treatment chamber includes a heat source such as radiant tubes 20 and a water tank 17 for decoring the casting.

Usui et al fail to teach the use of preheating the mold . However, Easwaran (col. 3, lines 50+) teach the use of preheating the mold then pouring molten metal into mold to form a cooling

arrest casting (frozen casting) in the mold having heat treated in a fluidized bed for the purpose of reducing porosity of the casting and controlling the cast microstructure. It would have been obvious to one having ordinary skill in the art to provide Usui et al the use of preheating the mold as taught by Easwaran in order to reduce porosity of the casting and controlling the cast microstructure.

4. Claims 68-73, 75, 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Usui et al in view of Easwaran and further in view of Conroy et al.

Usui et al in view of Easwaran fail to teach the use of introducing heated fluid into the mold by using nozzles. However, Conroy et al (col. 2, lines 8+) teach the use of introducing and discharging caustic solution at elevated temperature and pressure through nozzles for the purpose of removing ceramic core from the castings. It would have been obvious to one having ordinary skill in the art to provide Usui et al in view of Easwaran the use of introducing heated fluid into the mold by using nozzles as taught by Conroy et al in order to remove ceramic core from the castings

5. Claims 74, 87, 88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Usui et al in view of Easwaran and further in view of Crafton et al (US Pat. No.5,294,094 and 5, 565,046) .

Usui et al in view of Easwaran fail to teach the use of induction energy heat source ~~in claims 18 and 33~~ and fail to teach the use of a pressurized oxygen chamber ~~in claims 19 and 34~~. However, Craft et al (US '094) (col. 15, lines 23+) teach the use of induction energy heat source (electric heaters) for the purpose of effectively heat treating the casting. Further, Craft et al (US

'046) (col. 13, lines 15+) teach the use of a pressurized oxygen chamber for the purpose of combusting the binder material associated with the mold sand and core sand. It would have been obvious to one having ordinary skill in the art to provide Usui et al in view of Easwaran the use of induction energy heat source and the use of a pressurized oxygen chamber as taught by Craft et al in order to effectively heat treat the casting and removing the binder.

6. Claims 76-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Easwaran in view of Ryan et al.

Easwaran (col. 3, lines 50+) teach the use of preheating the mold then pouring molten metal into mold to form a cooling arrest casting (frozen casting) in the mold having heat treated in a fluidized bed and quenching the casting for the purpose of controlling the cast microstructure.

Easwaran fail to teach the use of control cooling of metal in the mold. However, Ryan et al (col. 3, lines 29+) teach the use of control cooling rate of metal in the mold through the use of controlling amount of forced air, watermist or a water spray for the purpose of reducing casting defect and enhancing the mechanical property of castings. It would have been obvious to one having ordinary skill in the art to provide Easwaran the use control cooling rate as taught by Ryan et al in order to reduce casting defect and enhance the mechanical property of castings.

7. Newly submitted claims 89-102 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: In claims 89-102, the claimed methods and apparatus for processing a metal casting are related a permanent metal die for receiving a molten metal.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 89-102 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Response to Arguments

Applicant's arguments filed on 6/14/05 have been fully considered but they are not persuasive. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, applicant argued that Usui et al fail to teach the use of preheating the mold . However, Easwaran (col. 3, lines 50+) teach the use of preheating the mold then pouring molten metal into mold to form a cooling arrest casting (frozen casting) in the mold having heat treated in a fluidized bed for the purpose of reducing porosity of the casting and controlling the cast microstructure. It would have been obvious to one having ordinary skill in the art to provide Usui et al the use of preheating the mold as taught by Easwaran in order to reduce porosity of the casting and controlling the cast microstructure. Further, applicant argued that Easwaran fail to teach the use of control cooling of metal in the mold. However, Ryan et al (col. 3, lines 29+) teach the use of control cooling rate of metal in the mold through the use of controlling amount

of forced air, watermist or a water spray for the purpose of reducing casting defect and enhancing the mechanical property of castings. It would have been obvious to one having ordinary skill in the art to provide Easwaran the use control cooling rate as taught by Ryan et al in order to reduce casting defect and enhance the mechanical property of castings.

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ing-Hour Lin whose telephone number is (571) 272-1180. The examiner can normally be reached on M-F (9:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

I.-H. Lin

9-16-05

KEVIN KERNS
PRIMARY EXAMINER

Kevin Kerns 9/19/05